



February 27, 1995

Mr. Dave Kendall
Dredged Material Management Office
US Army Corps of Engineers
Seattle District
4735 East Marginal Way South
P.O. Box 3755
Seattle, Washington 98124-2255

Reference: Sediment Characterization Study, Slip No. 4, Seattle

Dear Mr. Kendall:

Enclosed, for your review, please find a copy of PTI's report on the Sediment Characterization Study for Crowley Marine Services' (dba Pacific Terminals) facility on Slip No.4 in Seattle.

I believe that Mr. Lawrence McCrone of PTI said that the report would be forwarded to you in time for our scheduled meeting on Tuesday February 28, 1995. I apologize for the lateness in delivering this report to you, which was due to an oversight on my part, and hope that we will be able to answer whatever questions that you might have at our meeting.

Sincerel

Stephen Wilson

Manager, Environmental Compliance

Encl.

cc:

Slip No. 4 Correspondence

Jim Van der Veen

Corrected for SAP

Post Office Box 2287, Seattle, Washington 96111-2267 - (206) 443-6100 - Telex 6638207 - Fax (206) 443-6072
2900 Main Street, Alarmeda, California 94501 - (415) 546-2600 - Fax (415) 546-2606
Pier 1, Berth 47-49, Long Beach, California 90802-1098 - (310) 491-4700 - Telex 650447 - Fax (310) 491-4790
4300 B Street, Suite 507, Anchorage, Alaska 99503-5997 - (907) 563-1114 - Telex 6732564 - Fax (907) 762-3330
Pier 2, Honolulu, Hawaii 96813 - (808) 524-6644 - Fax (808) 536-6560
Post Office Box 2110, Jacksonville, Florida 32203-2100 - (904) 727-2200 - Telex 4611037 - Fax (904) 727-2401

## EXECUTIVE SUMMARY

PTI Environmental Services (PTI), on behalf of Crowley Environmental Services (Crowley), conducted an investigation at the Pacific Terminal Inc.'s (Pacific) facility on Slip No. 4 in Seattle, Washington. Crowley intends to conduct maintenance dredging in the outer portion of Slip No. 4 to provide continued access for ocean-going barges and tugboats. The purpose of this investigation was to characterize sediment conditions in the area where dredging is anticipated.

Surface sediments were sampled from four stations at the Pacific facility to provide a general characterization of sediment conditions and to provide a preliminary assessment of the likely suitability of the sediments for disposal at an unconfined, open-water site under the Puget Sound Dredged Disposal Analysis (PSDDA) program. Sediments were analyzed for selected semivolatile organic compounds, organochlorine pesticides, polychlorinated biphenyls (PCBs), selected metals (i.e., antimony, arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc), total organic carbon, and grain-size distribution.

Comparison of surface sediment characteristics at the four stations, including three within the area proposed for dredging, with applicable PSDDA criteria resulted in the following conclusions:

- 1. The concentrations of certain chemicals in the surface sediments at all four stations exceeded PSDDA screening levels. Dredged sediments with chemical concentrations exceeding these screening levels would require biological testing (i.e., sediment toxicity tests) to determine the suitability of those sediments for disposal at an unconfined, open-water site.
- 2. None of the chemical concentrations in the surface sediments at these four stations exceeded PSDDA maximum levels. (Such exceedances in dredged sediments proposed for disposal at an unconfined, open-water site would normally indicate that the sediments would be unsuitable for such disposal.)
- 3. Compositing of sediments over the depth to be dredged (e.g., 4 ft), as required for PSDDA testing, could potentially reduce the concentrations of chemicals below those found in surface sediments. Some exceedances of PSDDA screening levels are still likely to occur in the composite sediment samples. It is therefore likely that biological testing of the sediments proposed for dredging and disposal at an unconfined, open-water site will be required. Given the relatively low concentrations of most of the chemicals

in the sediments characterized to date, the likelihood of passing the biological tests is considered to be high.

The quality of the surface sediments was also evaluated by comparison of the chemical concentrations with applicable criteria of the Washington State Sediment Management Standards, resulting in the following conclusions:

- The concentrations of PCBs in the surface sediments at all four stations
  exceeded the sediment quality standards. No other chemicals exceeded the
  sediment quality standards. Surface sediments with chemical concentrations
  exceeding these sediment quality standards would lead the Washington
  Department of Ecology (Ecology) to conclude that some minor biological
  effects may be associated with these sediments, but not that the sediments
  need to be considered for remediation.
- 2. None of the chemical concentrations in the surface sediments at these four stations exceeded the cleanup screening levels of the Washington State Sediment Management Standards. Ecology uses exceedance of these cleanup screening levels in surface sediments as an indicator that a site may need to be considered for remediation.
- 3. According to the Washington State Sediment Management Standards, Ecology may designate a "station cluster of potential concern" when the average concentration of one or more chemicals from three stations within a station cluster exceeds the cleanup screening level. Such a designation may trigger the need for a hazard assessment, potentially requiring a much more detailed and costly sediment investigation. Because none of the chemical concentrations exceeded the cleanup screening levels, Ecology is unlikely to take the position that these stations represent a "station cluster of potential concern."
- 4. Because surface sediments within the area proposed for dredging exhibit relatively low levels of chemical contamination, planning for the proposed dredging project is warranted. Evaluation of the sediments for potential disposal at an unconfined, open-water site should proceed, recognizing that if the sediments were found to be unsuitable for such disposal, they could be disposed of in an environmentally protective manner elsewhere.

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Figure 2. Bathymetric contours of Slip No. 4, May, 1993

Figure 3. Bathymetric contours of Slip No. 4, August, 1994

## ACRONYMS AND ABBREVIATIONS

Corps U.S. Army Corps of Engineers
Crowley Crowley Marine Services, Inc.
cleanup screening levels

Ecology Washington Department of Ecology EPA U.S. Environmental Protection Agency

ML PSDDA maximum level
MLLW mean lower low water
Pacific Pacific Terminal Inc.

PAH polycyclic aromatic hydrocarbon

PCB polychlorinated biphenyl

PSDDA Puget Sound Dredged Disposal Analysis

PSEP Puget Sound Estuary Program
PTI PTI Environmental Services
SL PSDDA screening level
SQS sediment quality standards

TOC total organic carbon

## 1. INTRODUCTION

This report summarizes the methods, results, and conclusions of a sediment characterization study conducted in April, 1994 at the Pacific Terminal Inc.'s (Pacific) facility in Seattle, Washington. The Pacific facility, located in Slip No. 4 in the Duwamish River south of downtown Seattle, is shown in Figure 1.

The sediment study and this report were completed by PTI Environmental Services (PTI), on behalf of Crowley Marine Services, Inc. (Crowley). Crowley intends to conduct maintenance dredging in the outer portion of Slip No. 4 (see Figure 1 for approximate area to be dredged) to provide continued access for oceangoing barges and tugboats. The purpose of this study was to characterize sediment conditions in the area where dredging is anticipated. Surface sediments were sampled to provide a general characterization of sediment conditions and to provide a preliminary assessment of the likely suitability of the sediments for open-water disposal under the Puget Sound Dredged Disposal Analysis (PSDDA) program. All sampling and analytical testing was conducted in accordance with the Sediment Characterization Sampling and Analysis Plan (PTI 1994).

The dredging history of Slip No. 4 is described in Section 2. The results of a separate bathymetric survey of Slip No. 4 are then presented in Section 3. Methods for sediment sample collection, physical and chemical analyses of the sediment samples, and evaluation of the resulting data are described in Section 4. The results of physical and chemical analyses of the sediment samples are presented in Section 5. Interpretation of the results with regard to future dredging activities and potential actions by the Washington Department of Ecology (Ecology) is presented in Section 6. References are provided in Section 7 followed by an appendix containing copies of U.S. Army Corps of Engineers files on dredging activities in Slip No. 4 in 1981.

## 2. DREDGING HISTORY OF SLIP NO. 4

It is known that Slip No. is a remnant of the original course of the Duwamish River that existed prior to dredging and channelization of the river. No records have been found of dredging in the slip prior to 1980.

In May 1980, Marine Power & Equipment Company, Inc., of Seattle applied to the U.S. Army Corps of Engineers (Corps) for a permit to dredge approximately  $85,000 \text{ yd}^3$  of sandy silt from the western side of Slip No. 4 on the Duwamish River. This dredging project was part of a development of a dock and berthing facility on the property to the west of Slip No. 4. Copies of file materials archived at the Seattle District offices of the Corps are included as Appendix A. Cross sections of the slip prior to dredging indicate that the maximum depth was approximately 3 ft below mean lower low water (-3 ft MLLW). The target depth for the dredging project was -15 ft MLLW. A dredging permit was authorized by the Corps on January 27, 1981. The project was completed by a clamshell dredge sometime prior to April 10, 1981, at which time a post-dredging inspection verified a dredged depth of -15.2 ft MLLW. The dredged material was hauled away from Slip No. 4 by barge and disposed of in open water at the 4-Mile Rock disposal site in Elliott Bay. The post-dredging inspection verified that all work was completed within the terms of the permit.

## 3. BATHYMETRIC SURVEYS OF SLIP NO. 4

Crowley contracted with Chris Ransome & Associates to conduct bathymetric surveys of Slip No. 4 in May 1993 and again in August 1994. These surveys were conducted using a digital fathometer linked to a laser range:azimuth positioning system. The depth and horizontal position data were recorded simultaneously during acquisition, and a tidal correction was later applied to calculate actual depths. Electronic files of the depth and position data were subsequently provided to PTI. The data were manipulated into an input file format for the SURFER® software program. SURFER® was then used to generate contour maps of the bottom of Slip No. 4 with a contour interval of 1 ft. Separate contour maps were generated for the May 1993 and August 1994 bathymetric surveys (Figures 2 and 3, respectively).

In anticipation of the proposed maintenance dredging of Slip No. 4, SURFER® was used to estimate the volume of sediments lying above assumed dredging depths of -15 ft MLLW (the depth that the berth was dredged to in 1981) and -17 ft MLLW (a slightly deeper depth that Crowley considers appropriate for continuing use of the berth by oceangoing barges). The assumption was made that the dredging would extend approximately 125 ft in a direction perpendicular to the dock along the middle berth and include the area at the mouth of the slip extending to the property line (see Figure 3 for assumed dredging limits). For these preliminary volume estimates, allowance was not made for side slopes along the edges of the area to be dredged. The August 1994 bathymetric survey data were used to establish the current bottom surface within the area to be dredged. An assumed dredging depth of -15 ft MLLW would entail the removal of approximately 0-3 ft of sediments over most of the area; an assumed dredging depth of -17 ft MLLW would entail the removal of approximately 2-5 ft of sediments over most of the area. The volumes of sediments lying above the assumed dredged horizons within the area to be dredged were estimated to be 6,240 yd<sup>3</sup> for -15 ft MLLW and 12,080 yd<sup>3</sup> for -17 ft MLLW.

### 4. METHODS

This section summarizes the methods for sediment sample collection, physical and chemical analyses of the sediment samples, and evaluation of the resulting data.

#### 4.1 SEDIMENT SAMPLE COLLECTION

Surface sediment samples were collected at four stations in Slip No. 4 (Figure 1) on April 26, 1994, from the research vessel *Kittiwake*. The station positions were located using a standard global positioning system and visual correlation to fixed landmarks on shore. All samples were collected in accordance with standard techniques consistent with Puget Sound Estuary Program (PSEP) protocols (PSEP 1986a), following the procedures described in PTI (1994).

Three grab samples were collected at each sampling station using a modified 0.1-m<sup>2</sup> stainless-steel van Veen grab sampler deployed from an A-frame on the vessel. The overlying water of each suitable grab sample was removed by siphoning. The sampling crew then inspected the sediment for texture, color, odor, and evidence of contamination (e.g., color or sheen). The top 2 cm of sediment was removed using stainless-steel utensils and placed in a stainless-steel bowl. The sediments from the three grab samples at each station were combined to form a composite sample. The composite sediment sample was then homogenized by stirring with a stainless-steel spoon until the color and texture were visually uniform.

Subsamples from each composite sediment sample were placed in precleaned glass jars with Teflon®-lined lids and stored at 4°C until laboratory analysis. To prevent cross-station contamination, the grab sampler and all subsampling utensils were rinsed with seawater, scrubbed with detergent, and then rinsed sequentially with seawater, acetone, and hexane at the start of sampling at each station.

#### 4.2 PHYSICAL AND CHEMICAL ANALYSES

All four composite sediment samples were analyzed for grain-size distribution and for selected chemicals, as specified in PTI (1994). A quality assurance review was performed on the analytical data in accordance with project data quality objectives that are also specified in PTI (1994). All of the analytical results were judged to be suitable as received from the laboratory. As a result of the independent quality assurance review, the reported concentrations for bis[2-ethylhexyl]phthalate in all sediment samples were restated as undetected because of high concentrations detected in the method blank. Bis[2-ethylhexyl]phthalate is a common laboratory contaminant, and this qualification of

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the data does not affect the conclusions of this report. The reported concentrations of this compound were well below applicable criteria.

#### 4.2.1 Semivolatile Organic Compounds

Semivolatile organic compounds were analyzed using gas chromatography/mass spectrometry in accordance with procedures specified by U.S. Environmental Protection Agency (EPA) SW-846 Method 8270 (U.S. EPA 1986), as modified by PSEP (1989a). The PSEP modifications include the extraction of larger sample sizes (typically 50–100 g, wet weight basis), concentration to a smaller final extract volume (e.g., 0.5 mL), and demonstration of instrument sensitivity using low-level standards (e.g., 1–2 ng on-column). These modifications were used to attain the project detection limits (Table 1). Also, all samples were subjected to gel permeation chromatography cleanup procedures using EPA SW-846 Method 3640 (U.S. EPA 1986). Gel permeation chromatography was used to reduce interferences that may inhibit attainment of the project detection limits.

#### 4.2.2 Organochlorine Pesticides and Polychlorinated Biphenyls

Organochlorine pesticides and total polychlorinated biphenyls (PCBs) were analyzed using the gas chromatography/electron capture detection technique specified by EPA SW-846 Method 8080, as modified by PSEP (1989a). The PSEP modifications include the extraction of larger sample sizes (typically 50–100 g, wet weight basis), concentration to a smaller final extract volume (e.g., 1-5 mL), and demonstration of instrument sensitivity using low-level standards. These modifications were used to attain the project detection limits (Table 1). The sample extracts were subjected to florisil column cleanup (EPA SW-846 Method 3610) and sulfur cleanup (EPA SW-846 Method 3660) as needed to reduce potential interferences that would inhibit attainment of the project detection limits.

#### 4.2.3 Metals

Selected metals were analyzed by appropriate EPA SW-846 Methods (U.S. EPA 1986), as modified by PSEP (1989b). Sediment samples intended for metals analyses were subjected to a strong-acid digestion described in detail in PSEP (1989b). The strong-acid digestion technique uses nitric and hydrochloric acids and hydrogen peroxide, and yields results for most metals that are comparable with results achieved using the alternative total metals digestion procedure discussed in PSEP (1989b). Analyses of antimony, arsenic, cadmium, chromium, copper, silver, and zinc were conducted using inductively coupled plasma spectrometry (EPA SW-846 Method 6010; U.S. EPA 1986). Mercury analyses were conducted according to EPA SW-846 Method 7471 (U.S. EPA 1986) using cold vapor atomic absorption spectrometry. Lead was determined by graphite furnace

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atomic absorption spectrometry (EPA SW-846 Method 7421; U.S. EPA 1986) to achieve the project detection limits (Table 1).

### 4.2.4 Total Organic Carbon

Total organic carbon (TOC) in sediment samples was measured using high-temperature combustion techniques on subsamples that were treated to remove inorganic carbon. Following combustion of the sample, TOC content was determined coulometrically using EPA Method 415.1 (PSEP 1986b).

#### 4.2.5 Grain-Size Distribution

Grain-size distributions were determined on samples by wet-sieving samples oxidized with hydrogen peroxide and then dry-sieving the gravel and sand fractions (Plumb 1981; PSEP 1986b). The silt-clay fraction was subdivided into silt and clay fractions using a pipette technique (Plumb 1981, Particle Size Method 2).

#### 4.3 DATA EVALUATION

Chemical results for sediment samples from the four stations in Slip No. 4 were evaluated by comparisons with the PSDDA screening levels (SLs) and PSDDA maximum levels (MLs). The PSDDA program manages the disposal of dredged sediments at unconfined, open-water disposal sites in Puget Sound. The PSDDA SLs represent relatively low chemical concentrations below which there is reason to believe the sediments would be suitable for unconfined, open-water disposal without biological testing. The PSDDA MLs represent higher chemical concentrations above which there is reason to believe the sediments would be unsuitable for unconfined, open-water When chemical concentrations are between the PSDDA SLs and MLs. biological testing (i.e., sediment toxicity tests) is required to determine the suitability of the sediments for unconfined, open-water disposal. At chemical concentrations above the PSDDA MLs, it is still the dredging proponent's option to conduct biological testing to demonstrate the suitability of the dredged material for unconfined, open-water disposal. Because an entire volume of sediments is being considered for unconfined, open-water disposal, the PSDDA program requires the collection and analysis of composite sediment samples over the depth of sediments to be dredged to characterize the overall sediment concentrations of chemicals of concern.

The chemical results were also evaluated by comparisons with the sediment quality standards (SQS) and cleanup screening levels (CSL) in the Washington State Sediment Management Standards (Chapter 173-204, Washington Administrative Code). The SQS represent numerical chemical concentration criteria that define the degree of sediment quality that is expected to cause no adverse effects in biological resources of Puget Sound marine sediments. At chemical concentrations above the SQS, there is reason to believe

that the sediment may cause some minor adverse biological effects. The CSL represent numerical chemical concentration criteria that define the degree of sediment quality that is expected to cause an unsuitable level of effects to biological resources. At chemical concentrations above the CSL, consideration may have to be given to the need for sediment remediation. The SQS and CSL criteria are typically applied to surface or near-surface sediments because they represent the biologically active zone where potential chemical effects are of greatest concern. As in the case of the PSDDA program, the Washington State Sediment Management Standards allow the results of biological testing to override a determination based on sediment chemistry alone.

#### 5.1.2 Semivolatile Organic Compounds

Certain semivolatile organic compounds listed in Table 3 were found in concentrations exceeding the PSDDA SLs at all four stations. These compounds included a number of polycyclic aromatic hydrocarbon (PAH) compounds and dibenzofuran. None of the concentrations of these compounds exceeded PSDDA MLs (Table 3) or the SQS or CSL (Table 4), however.

#### 5.1.3 Organochlorine Pesticides and Polychlorinated Biphenyls

As summarized in Table 3, the reported concentrations of total DDT at all four stations exceeded the PSDDA SL (but not the PSDDA ML). The concentration of total chlordane exceeded the PSDDA SL only at Station 4; there is no PSDDA ML for total chlordane. There are neither SQS nor CSL for any organochlorine pesticides.

The reported concentrations of total DDT and total chlordane may be overestimated because of interferences from the much higher concentrations of total PCBs in these samples. At the concentrations reported for these pesticides, however, this possibility cannot be confirmed.

The concentrations of total PCBs exceeded the PSDDA SL at all four stations, but none exceeded the PSDDA ML. Similarly, the concentrations of total PCBs exceeded the SQS at all four stations, but none exceeded the CSL (Table 4).

#### 5.2 TOTAL ORGANIC CARBON

There was a relatively narrow range in TOC content (1.65-2.82 percent) among the four stations summarized in Table 5. The highest TOC content was found at Station 4, which also had the highest content of fine-grained sediments (i.e., silt plus clay; 83.4 percent).

#### 5.3 GRAIN-SIZE DISTRIBUTION

Grain-size distributions are summarized in Table 5. With the exception of Station 4, the grain-size distributions in sediments from the four stations were fairly uniform, ranging from 44.5 to 52.5 percent fine-grained sediments (i.e., silt plus clay) and from 46.6 to 53.0 percent sand. Station 4 had much finer grained sediments than the other stations (i.e., 83.4 percent fine-grained and only 16.7 percent sand), which is consistent with its higher TOC content (2.82 percent). There was very little gravel in any of the sediment samples (0-0.77 percent).

#### 5.4 INTERSTITIAL SALINITY

Slip No. 4 is an embayment along the Duwamish River (Figure 1). The SQS and CSL are intended to apply only to Puget Sound marine sediments (i.e., those Puget Sound sediments having an interstitial salinity greater than 25 parts per thousand [ppt]). The lower reach of the Duwamish River is a salt-wedge estuary, however, with saline water underlying a surface layer of fresh or low salinity water. The interstitial salinity of the surface sediment at Station 4 (Figure 1) was measured onboard the vessel with a refractometer and found to be 23 ppt. This salinity is only marginally below the lower salinity limit for Puget Sound marine sediments, and therefore comparisons can still be made to the SQS and CSL to give a general indication of sediment quality.

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## 6. DISCUSSION

This section provides a preliminary evaluation of the suitability of the Slip No. 4 sediments for disposal at an unconfined, open-water disposal site by comparisons with criteria used in the PSDDA program, and an assessment of surface sediment quality by comparisons with the criteria of the Washington State Sediment Management Standards.

# 6.1 COMPARISON OF CHEMICAL RESULTS WITH PSDDA SCREENING LEVELS AND PSDDA MAXIMUM LEVELS

A definitive assessment of the suitability of the sediments to be dredged from Slip No. 4 for disposal at an unconfined, open-water site in Puget Sound would require analysis of samples composited over the depth to be dredged. Nevertheless, a preliminary assessment can be made based on the chemistry of surface sediment samples and assumptions about subsurface sediment characteristics.

Although the exact depth of sediments to be dredged in Slip No. 4 has yet to be determined, a lift of 4 ft (i.e., a typical lift for clamshell dredging) is assumed for this assessment. The PSDDA program allows compositing over depths of up to 4 ft. Hence, surface sediments will be mixed with sediments from deeper depths below the surface prior to analysis. Such compositing could potentially reduce the concentrations of chemicals below those found in surface sediments if the deeper sediments have lower chemical concentrations. Because the chemistry of subsurface sediments has yet to be documented, however, the effect of such compositing cannot be predicted at this time.

None of the chemical concentrations exceeded PSDDA MLs in any of the four surface sediment samples. If any chemicals in the sediments to be dredged were found to exceed the MLs, the PSDDA program would require extensive biological testing to demonstrate the suitability of those sediments for unconfined, open-water disposal. Such testing might only confirm that the sediments are not suitable for such disposal.

As discussed in Section 5.1, a number of PAH compounds exceeded PSDDA SLs in the three samples within the area proposed for dredging. The concentrations of most of these compounds were either only slightly above their respective PSDDA SLs, or, at most, less than a factor of 3 above the PSDDA SLs. Hence, even a relatively minor amount of dilution by compositing with subsurface sediments having lower concentrations of these compounds may reduce the concentrations below the PSDDA SLs. The PSDDA MLs for all of the PAH compounds are higher than the corresponding PSDDA SLs by a factor of at least 10. Therefore, compositing of these surface sediments with subsurface sediments is unlikely to increase the concentrations of these PAH compounds

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above the MLs, unless subsurface concentrations are much higher than surface concentrations.

At two of the three stations within the area proposed for dredging, the concentrations of dibenzofuran were only marginally above the PSDDA SL, while at all three stations the concentrations of total DDT were within a factor of 2 of the PSDDA SL. Only a relatively minor amount of dilution by compositing with subsurface sediments having lower concentrations of dibenzofuran and total DDT would be necessary to reduce the concentrations below the PSDDA SLs. The PSDDA MLs for dibenzofuran and total DDT are each 10-fold higher than the corresponding PSDDA SLs. Therefore, compositing of these surface sediments with subsurface sediments is unlikely to increase the concentrations of dibenzofuran and total DDT above the MLs, unless subsurface concentrations are much higher than surface concentrations.

Total PCB concentrations exceeded the PSDDA SL to a greater extent than any other chemical concentrations in the three surface sediment samples from within the area proposed for dredging. Exceedance factors for total PCBs at Stations 1, 2, and 3 were 2.8, 4.7, and 7.6, respectively. It is less likely that the concentrations of total PCBs will be reduced below PSDDA SLs through compositing with subsurface sediments than would other compounds with such exceedances. The PSDDA ML for total PCBs (2,500 mg/kg dry weight) is nearly 4-fold higher than the average concentration (650 mg/kg dry weight) detected in the three surface sediment samples from within the area proposed for dredging (i.e., Stations 1, 2, and 3). This suggests that compositing of these surface sediments with subsurface sediments is unlikely to increase the concentrations of total PCBs above the MLs, unless subsurface concentrations are much higher than surface concentrations.

It is likely that at least some chemical concentrations in a sediment sample composited over a 4-ft interval would still exceed one or more PSDDA SLs, and therefore biological testing of the sediments would be required. The fact that most such exceedances would likely be at the lower end of the range between the PSDDA SLs and MLs suggests that there is a high likelihood that the sediments would pass the biological tests and be judged suitable for unconfined, open-water disposal at a PSDDA site. In addition, total PCBs have not been shown to be acutely toxic to amphipods and bivalve larvae at concentrations below 1,100 mg/kg dry weight (Barrick et al. 1988), which is above the highest concentration found at Stations 1, 2, or 3. These are two of the organisms used in sediment toxicity tests under the PSDDA program. This fact, in combination with the relatively low concentrations of other chemicals in the surface sediments from Stations 1, 2, and 3, suggests a high likelihood of these sediments passing the biological tests under the PSDDA program.

# 6.2 COMPARISON OF CHEMICAL RESULTS TO SEDIMENT QUALITY STANDARDS AND CLEANUP SCREENING LEVELS

The SQS and CSL of the Washington State Sediment Management Standards are intended to be used as guidelines for assessing the quality of marine surface sediments in Puget Sound. As discussed in Section 5.4, the interstitial salinity of the sediments sampled in Slip No. 4 is only slightly below the lower salinity limit (25 ppt) for Puget Sound marine sediments, and therefore comparisons can still be made to the SQS and CSL to give a general indication of sediment quality.

As discussed in Section 5.1, only total PCBs exceeded the SQS in surface sediments at the three stations within the area proposed for dredging. Exceedance factors for total PCBs at Stations 1, 2, and 3 were 1.8, 2.8, and 5.0, respectively. According to the Washington State Sediment Management Standards, chemical concentrations above the SQS indicate that some minor adverse biological effects may be associated with these sediments. It is notable, however, that no chemicals in these three sediment samples exceeded the CSL, the level indicative of unsuitable biological effects that may trigger the need for remediation. Chemical concentrations above the SQS, but not above the CSL, are not sufficient reason to consider the need for remediation.

Ecology uses the CSL to screen "station clusters" to determine whether they should be considered "station clusters of potential concern," and therefore should be evaluated for possible remediation. A "station cluster" is a group of contiguous sediment stations with similar chemical concentrations. According to the Washington State Sediment Management Standards, Ecology may designate a "station cluster of potential concern" when the average concentration of one or more chemicals from three stations within a station cluster exceeds the CSL. Such a designation may trigger the need for a hazard assessment, potentially requiring a much more detailed and costly sediment investigation.

Because none of the chemical concentrations exceeded the CSL at any of the four stations in Slip No. 4, the proposed dredging project should not be constrained by designation by Ecology of a "station cluster of potential concern." Furthermore, removal of the marginally contaminated sediments from within the area proposed for dredging is likely to result in a net improvement in environmental conditions within the slip. Evaluation of the sediments for potential disposal at an unconfined, open-water site should proceed, recognizing that if the sediments were found to be unsuitable for such disposal, they could be disposed of in an environmentally protective manner elsewhere.

## 7. REFERENCES

Barrick, R.C., D.S. Becker, L.B. Brown, et al. 1988. Sediment quality values refinement: 1988 update and evaluation of Puget Sound AET. Volume I. Final Report. Prepared for Tetra Tech, Inc., Bellevue, WA, and the U.S. Environmental Protection Agency, Seattle, WA. PTI Environmental Services, Bellevue, WA.

Plumb, R.H., Jr. 1981. Procedure for handling and chemical analysis of sediment and water samples. Technical Report EPA/CE-81-1. U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.

PSEP. 1986a. General QA/QC considerations for collecting environmental samples in Puget Sound. U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Puget Sound Estuary Program, Seattle, WA.

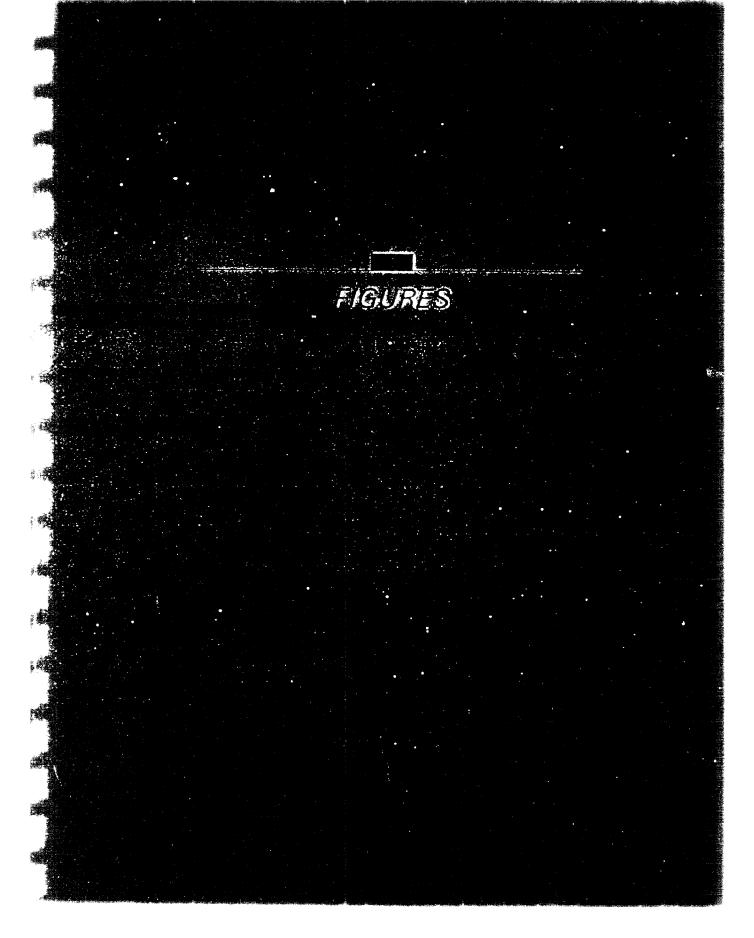
PSEP. 1986b. Recommended protocols for measuring conventional sediment variables in Puget Sound. U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Puget Sound Estuary Program, Seattle, WA.

PSEP. 1989a. Recommended guidelines for measuring organic compounds in Puget Sound sediment and tissue samples. U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Puget Sound Estuary Program, Seattle, WA.

PSEP. 1989b. Recommended protocols for measuring metals in Puget Sound water, sediment and tissue samples. U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Puget Sound Estuary Program, Seattle, WA.

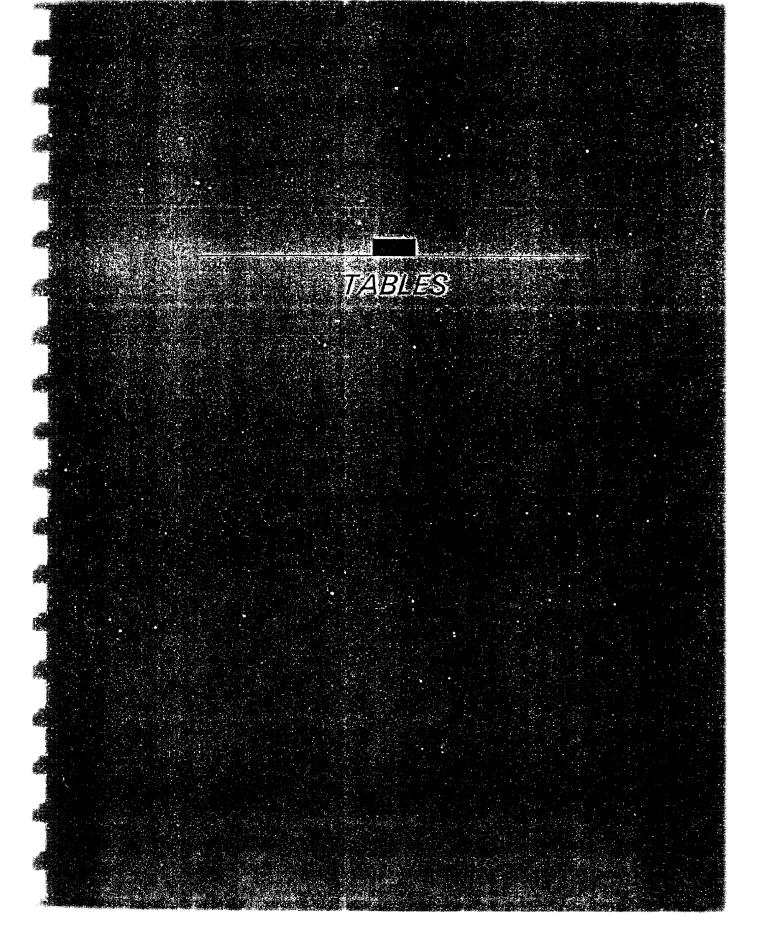
PTI. 1994. Sediment characterization sampling and analysis plan. Crowley's Pacific Terminal facility, Seattle, Washington. Prepared for Crowley Marine Services, Inc. PTI Environmental Services, Bellevue, WA. 14 pp. + appendices.

U.S. EPA. 1986. Test methods for evaluating solid waste (SW-846): physical/chemical methods. U.S. Environmental Protection Agency, Office of Solid Waste, Washington, DC.



KCSlip4 59430

KCSlip4 59431



KCSlip4 59432

TABLE 1. SUMMARY OF DATA QUALITY OBJECTIVES

Variable Metrix	Matrix	Units	Detection Limit Goels*	Quantification Limit Goals <sup>a</sup>	Bias (percent)	Precision (percent)	Completeness (percent)	Holding Time (days)
Organic Analyses								
Selected semivolatile organic compounds	Sediment	ив/кв	10-50	40-200	100±50	± 20	0 5	10 <sup>6</sup>
Total polychlorinated biphenyls	Sediment	ng/kg	1-5	24	100±50	± 50	ග ග	10° 5°
Organochlorine pesticides	Sediment	ng/kg	0.1–15	1-30	100±50	+ 50	95	10 <sup>b</sup>
Metals Analyses								
Antimony	Sediment	mg/kg	24	24	100±25	±35	92	180
Arsenic	Sediment	mg/kg	4	4	100±25	±35	<u>හ</u> ස	180
Cadmium	Sediment	mg/kg	8	2	100±25	±35	92	180
Chromium	Sediment	mg/kg	4	4	100±25	±35	90	180
Copper	Sediment	mg/kg	10	10	100±25	±35	92	180
Lead	Sediment	mg/kg	1.2	1.2	100±25	+35	95	180
Mercury	Sediment	mg/kg	0.1	0.1	100±25	+35	95	28
Silver	Sediment	mg/kg	4	. 4	100±25	±35	95	180
Zinc	Sediment	mg/kg	ထ	ထ	100±25	∓32	92	180
Conventional Analyses								
Total organic carbon	Sediment	mg/kg	<del>-</del>	<u>.</u>	±25	±20	92	28
Grain size	Sediment	percent	*	***	±10	±10	95	28

1

<sup>a</sup> Goals are given on a dry-weight basis assuming 50-percent moisture.

<sup>b</sup> Refrigerated samples must be extracted within the specified number of days and refrigerated extracts must be analyzed within 40 days following extraction. Archived samples will be frozen and may be held up to 1 year (PSEP 1989a).

TABLE 2. SEDIMENT SAMPLES COLLECTED FROM SLIP NO. 4

Station	Sediment Sample ID
1	SC001
2	SC002
3	SC003
4	SC004

TABLE 3. COMPARISON OF CHEMICAL RESULTS TO PSDDA SCREENING LEVELS AND MAXIMUM LEVELS

	Station							
Chemical	1	2		3	4		SL	ML
Metals (mg/kg dry weight)								-
Antimony	8.0	1.2		1.1	1.8		20	20
Arsenic	11	10		12	18		57	70
Cadmium	0.4	0.4		0.4	0.8		0.96	9.
Copper	55	51		47	74		81	81
Lead	31	37		35	59	_	66	66
Mercury	0.1	0.12		0.11	0.22		0.21	2.
Nickel	27	29		27	29		140	_
Silver	0.4	0.3		0.3	0.6		1.2	6.
Zinc	124	125		125	154		160	160
Organic Compounds (µg/kg dry weigh	ŋ <u>a</u>		=	_				
Polycyclic aromatic hydrocarbons	710	122	=	518	48	8		
Total LPAH <sup>D</sup>	727	1245	_	_584_	510ر	•	610	610
Naphthalene	46	28		23	24		210	210
Acenaphthylene	17	<i>U</i> 18	U	16 <i>l</i>	J 22	U	64	64
Acenaphthene	100	89	_	32	23		63	63
Fluorene	77	100	┧ .	37	37	_	64	64
Phenanthrene	430	860	IJ L	340	350	]	320	320
Anthracene	57	150		86	54		130	130
2-Methylnaphthalene	17	U18	υ_	16 (	J <u>22</u>	U	67	67
Total HPAH <sup>C</sup>	3077	4915	J L	2585	3340	]	1800	5100
Fluoranthene	660	1400	-1 -	560	620	_	630	630
Pyrene	670	940	J L	500	510	J	430	730
Benzo [a] anthracene	380	660		340	320		450	450
Chrysene	300	390	_	290	360	_	670	670
Total benzofluoranthenes d	640	940	_	520	960	_	800	800
Benzo (a) pyrene	210	320		200	300	_	680	680
Indeno[1,2,3-cd]pyrene	100	130	] [	79	120	ا	69	520
Dibenz(a,h)anthracene	46	47		43	64		120	120
Benzo (ghi) perylene	71	88		53	86		540	540
Chlorinated benzenes								
1,3-Dichlorobenzene	17	<i>U</i> 18	U	16 (	J 22	U	170	_
1,4-Dichlorobenzene	17	<i>U</i> 18	U	16 6	J 22	U	26	26
1,2-Dichlorobenzene	17	<i>U</i> 18	U	16 (	J 22	U	19	35
1,2,4 - Trichlorobenzene	17	<i>U</i> 18	U	16 (	J 22	U	13	6
Hexachlorobenzene	17	<i>U</i> 18	U	16 8	J 22	U	23	23
Phthalate esters								
Dimethyl phthalate	17	<i>U</i> 18	U	16 (	J 22	U	160	_
Diethyl phthalate	17	<i>U</i> 18	U	16	y 22	U	97	_
Di-n-butyl phthalate	17	<i>U</i> 18	U	16	IJ <b>3</b> 4		1400	_
Butyl benzyl phthalate	17	<i>U</i> 18	U	17	22	U	470	_
bis[2-ethylhexyl]phthalate	240	<i>UB</i> 190	UB	290	UB 410	UB	3100	_
Di-n-octyl phthalate	17		U	16		U	6200	

\* incorrect summing (used SMS mething - corrected values shown

TABLE 3. (cont.)

		Sta	tion			
Chemical	1	2	3	4	SL	ML
Phenois						
Phenoi	33 <i>U</i>	<b>35</b> <i>U</i>	32 U	44 <i>U</i>	120	1200
2-Methylphenol	17 <i>U</i>	18 <i>U</i>	16 <i>U</i>	22 U	20	72
4 - Methylpheno!	17 <i>U</i>	18 <i>U</i>	16 U	22 U	120	1200
2,4-Dimethylphenol	<b>33</b> <i>U</i>	<b>35</b> <i>U</i>	32 U	44 U	29	50
Pentachlorophenol	83 <i>U</i>	88 <i>U</i>	80 U	110 <i>U</i>	100	690
Miscellaneous extractable compo	unds					
Benzyl alcohol	83 U	88 <i>U</i>	80 U	110 <i>U</i>	25	73
Benzoic acid	170 <i>U</i>	180 <i>U</i>	160 U	220 U	400	690
Dibenzofuran	72	65	30	29	54	540
Hexachloroethane	33 U	35 <i>U</i>	32 U	44 <i>U</i>	1400	14000
Hexachlorobutadiene	33 <i>U</i>	35 <i>U</i>	<b>32</b> U	44 U	29	290
N-Nitrosodiphenylamine	17 <i>U</i>	18 <i>U</i>	16 <i>U</i>	22 U	28	220
Pesticides	3.30	4.40	4.00	8.80		
Total DDT <sup>e</sup>	12.4	10.1	9.4	18.7	6.9	69
Aldrin	2.8 U	5.4	4.6	7.7	10	
Total chlordane f	5.33	10	6.47	10.3	10	
Dieldrin	5.1 <i>U</i>	7.8 <i>U</i>	6.6 U	120 U	10	
Heptachlor	0.73 <i>U</i>	1.4 U	0.87 <i>U</i>	0.93 <i>U</i>	10	
Lindane	0.83 <i>U</i>	0.87 <i>U</i>	0.4 U	5 <i>U</i>	10	
Total polychlorinated biphenyls	360	610	990	1300	130	2500

Note -- no maximum level has been established for these chemicals

HPAH - high molecular weight polycyclic aromatic hydrocarbons

LPAH — low molecular weight polycyclic aromatic hydrocarbons

ML - PSDDA maximum level

PSDDA - Puget Sound Dredged Disposal Analysis program

SL - PSDDA screening level

Outlined values indicate exceedance of SLs.

There were no exceedances of MLs.

<sup>&</sup>lt;sup>a</sup> Where SLs and MLs in this table represent the sums of individual compounds (e.g., total LPAHs and total HPAHs) or groups of isomers (e.g., total PCBs), and a chemical analysis identified an undetected value for one or more individual compounds or groups of isomers, the detection limit is used for calculating the sum of he respective compounds or groups of isomers.

b Total LPAH represents the sum of the concentrations of the following LPAH compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracine. 2—Methylnaphthalene is not included in the total LPAH definition. The total LPAH SLs and MLs are not the sums of the corresponding SLs and MLs listed for the individual LPAH compounds.

<sup>&</sup>lt;sup>C</sup> Total HPAH represents the sum of the concentrations of the following HPAH compounds: fluoranthene, pyrene, benz[a]anthracene, chrysene, total benzofluoranthenes, benzo[a] pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[ghi]perylene. The total HPAH SLs and MLs are not the sums of the corresponding SLs and MLs listed for the individual HPAH compounds.

 $<sup>^{</sup>m d}$  Total benzofluoranthenes represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.

e Total DDT represents the sum of para, para'-DDD, DDE, and DDT.

f Total chlordane represents the sum of the alpha and gamma isomers.

TABLE 4. COMPARISON OF CHEMICAL RESULTS TO SEDIMENT QUALITY STANDARDS AND CLEANUP SCREENING LEVELS FOR PUGET SOUND MARINE SEDIMENTS

			Stations			
Chemical	1	2	3	4	SQS	cs
Metals (mg/kg dry weight)			<u> </u>			
Arsenic	11	10	12	18	57	9
Cadmium	0.4	0.4	0.4	8.0	5.1	6.
Chromium	49	49	44	55	260	27
Copper	55	51	47	74	390	39
Lead	31	37	35	59	450	53
Mercury	0.1	0.12	0.11	0.22	0.41	0.5
Silver	0.4	0.3	0.3	0.6	6.1	6.
Zinc	124	125	125	154	410	96
lonionizable Organic Compound Aromatic Hydrocarbons	s (mg/kg or	ganic carbo	n) <sup>a,b</sup>			
Total LPAH <sup>C</sup>	43.3	68.4	32.3	18.1	370	78
Naphthalene	2.7	1.5	1.4	0.85	99	17
Acenaphthylene	1.0 <i>U</i>	0.99 U	0.97 U	0.78 <i>U</i>	66	6
Acenaphthene	6.0	4.9	1.9	0.82	16	5
Fluorene	4.6	5.5	2.2	1.3	23	7
Phenanthrene	25.6	47.3	20.6	12.4	100	48
Anthracene	3.4	8.2	5.2	1.9	220	120
2-Methylnaphthalene	1.0 <i>U</i>	0.99 U	0.97 <i>U</i>	0.78 U	38	
Total HPAH <sup>Č</sup>	183	270	157	118	960	530
Fluoranthene	39.3	76.9	33.9	22.0	160	120
Pyrene	39.9	51.6	30.3	18.1	1000	140
Benzo[a]anthracene	22.6	36.3	20.6	11.3	110	27
Chrysene	17.9	21.4	17.6	12.8	110	46
Total benzofluoranthenes	_	51.6	31.5	34.0	230	45
Benzo[a]pyrene	12.5	17.6	12.1	10,6	99	21
Indeno[1,2,3-cd]pyrene	6.0	7.1	4.8	4.3	34	£ 1
Dibenz[a,h]anthracene	2.7	2.6	2.6	2.3	12	3
Benzo[ghi]perylene	4.2	4.8	3.2	3.0	31	7
Chlorinated Benzenes				3.0	٠.	•
1,2-Dichlorobenzene	1,0 <i>U</i>	0. <del>99</del> U	0.97 <i>U</i>	0.78 <i>U</i>	2.3	2
1,4 - Dichlorobenzene	1.0 <i>U</i>	0.99 <i>U</i>	0.97 <i>U</i>	0.78 <i>U</i>	3.1	_
1,2,4-Trichlorobenzene	1,0 <i>U</i>	0.99 U	0.97 U	0.78 <i>U</i>	0.81	1.
Hexachlorobenzene	1.0 <i>U</i>	0.99 <i>U</i>	0.97 U	0.78 <i>U</i>	0.38	2
Phthalate Esters					3.33	-
Dimethyl phthalate	1.0 <i>U</i>	0.99 <i>U</i>	0.97 <i>U</i>	0.78 <i>U</i>	53	5
Diethyl phthalate	1.0 <i>U</i>	0.99 <i>U</i>	0.97 <i>U</i>	0.78 <i>U</i>	61	11
Di-n-butyl phthalate	1.0 <i>U</i>	0.99 U	0.97 U	1.2	220	170
Butyl benzyl phthalate	1.0 <i>U</i>	0.99 U	1.0	0.78 //	4.9	
bis[2-ethylhexyl]phthaiat		10.4 <i>UB</i>	17.6 UB	14.5 <i>UB</i>	47	7
Di-n-octyl phthalate	1.0 <i>U</i>	0.99 U	0.97 <i>U</i>	0.78 <i>U</i>	58	450
Miscellaneous						
Dibenzofuran	4.3	3.6	1.8	1.0	15	5
Hexachlorobutadiene	2.0 <i>U</i>	1.9 <i>U</i>	1.9 <i>U</i>	1.6 <i>U</i>	3.9	6
N - Nitrosodiphenylamine	1.0 <i>U</i>	0.99 <i>U</i>	0.97 <i>U</i>	0.78 <i>U</i>	11	1
Total PCBs	22	34	60	46	12	6
onizable Organic Compounds (μί	g/kg dry wei	ght)	<del></del>			
Phenol	ິ 33 <i>ບ</i> ີ	35 U	32 U	44 <i>U</i>	420	120
2-Methylphenol	17 <i>U</i>	18 <i>U</i>	16 U	22 <i>U</i>	63	126
4 – Methylphenol	17 U	18 <i>U</i>	16 U	22 <i>U</i>	670	67
2,4-Dimethylphenol	33 <i>U</i>	35 U	32 U	44 <i>U</i>	29	2
Pentachlorophenol	83 <i>U</i>	88 <i>U</i>	80 <i>U</i>	110 U	360	69
Benzyl alcohol	83 <i>U</i>	88 <i>U</i>	80 U	110 U	57	7
Benzoic acid	170 <i>U</i>	180 <i>U</i>	160 <i>U</i>	220 <i>U</i>	650	65

Note:

- cleanup screening levels (WAC 173-204-520)

HPAH - high molecular weight polycyclic aromatic hydrocarbon LPAH - low molecular weight polycyclic aromatic hydrocarbon

PCBs — polychlorinated biphenyls SQS — sediment quality standards (WAC 173 – 204 – 320)

Outlined values indicate exceedance of SQS.

There were no exceedances of CSLs.

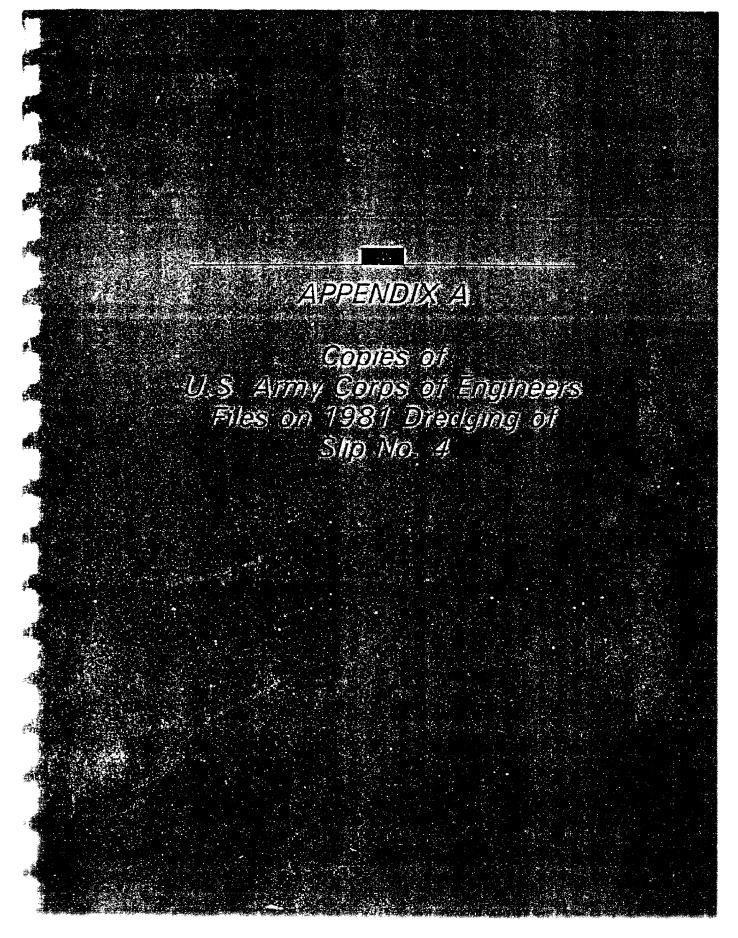
- a Where SLs and MLs in this table represent the sums of individual compounds (e.g., total LPAHs and total HPAHs) or groups of isomers (e.g., total PCBs), and a chemical analysis identified an undetected value for one or more individual compounds or groups of isomers, the detection limit is used for calculating the sum of the respective compounds or groups of isomers.
- The listed values represent concentrations in parts per million "normalized" on a total organic carbon basis. To normalize to total organic carbon, the dry-weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.
- <sup>C</sup> Total LPAH represents the sum of the concentrations of the following LPAH compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracine. 2-Methylnaphthalene is not included in the total LPAH definition. The total LPAH SLs and MLs are not the sums of the corresponding SLs and MLs listed for the individual LPAH compounds.
- d Total HPAH represents the sum of the concentrations of the following HPAH compounds: fluoranthene, pyrene, benz[a]anthracene, chrysene, total benzofluoranthenes, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[ghi]perylene. The total HPAH SLs and MLs are not the sums of the corresponding SLs and MLs listed for the individual HPAH compounds.
- <sup>e</sup> Total benzofluoranthenes represents the sum of the concentrations of the b, j, and k isomers of benzofluoranthene.

TABLE 5. SEDIMENT GRAIN-SIZE DISTRIBUTION AND TOTAL ORGANIC CARBON CONTENT

		Grai	Grain-size Fraction (percent)				
Station	Gravel	Sand	Silt	Clay	Finesa	(percent)	
1	0.75	53.0	34.6	9.93	44.5	1.68	
2	0.77	46.6	41.2	11.3	52.5	1.82	
3	0.39	52.5	36.4	10.5	46.9	1.65	
4	0.00	16.7	67.8	15.6	83,4	2.82	

Note: TOC - total organic carbon

<sup>&</sup>lt;sup>a</sup> Fines – fine-grained fraction (i.e., silt plus clay).



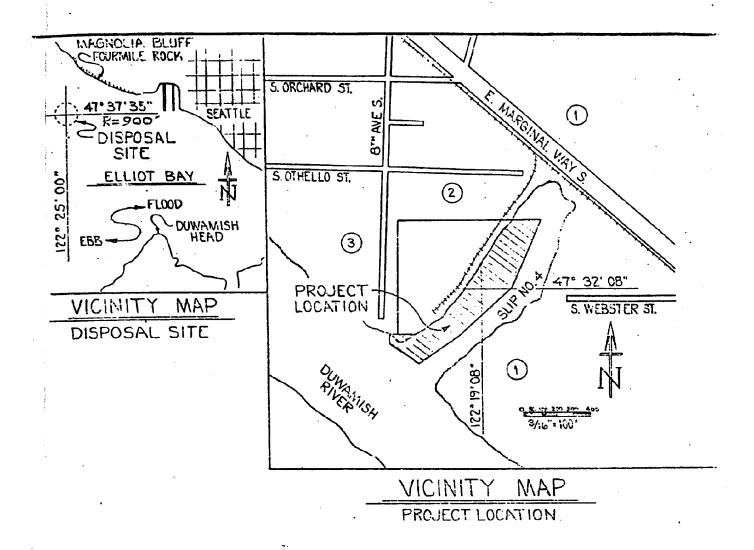
KCSlip4 59440

## inspection record

### FOR

PERBUTTED WORK IN HAVICABLE WATERS BORTH PACIFIC DIVISION, CORPS OF ENGINEERS

Hatrict beattle	12130 pm
ermit No. 071-048-2-006-5-6	Date of Inspection 10 1700 5.
Termit No. 071-048-2-006-5-20  Termittee 2: No. 1 September	Inspector LARSON FENSILE
Action SH K CC. 2	Type of Work Deceler
STA	ATUS
Sork CompletedYesNo	Not Sure
Estimated Percent Complete / / va 7	
Work In Progress Yes Yes	
<del></del>	1.1 Auce
Completed Entire Scope of Permitted Wo	ork Yes Apparently No
Standard Conditions: Yes	Apparently No Doubtful
Special Conditions: Yes	Apparently No Doubtful
Harman La Day	
Comments: 1197513 Destin	Apparently No No Section 15.8
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NPD Form 288(Rev) Nav //	610
	TAR "A" Page 1 of 1



NO FEDERAL PIERHEAD LINES ESTABLISHED PURPOSE: TO ESTABLISH A SAFE DEPTH FOR COMMERCIAL MARINE TRAFFIC. DATUM: M.L.L.W.= 0.00 N.O.S.

## ADJACENT PROPERTY OWNERS:

- 1 BOEING AIRCRAFT CO., 7755 E. MARGINAL WAY S. SEATTLE, WA. 98108
- 2 LAYRITE CONCRETE PRODUCTS CO., 7265 E. MARGINAL WAY S. SEATTLE, WA. 98108
- 3 PUGET SOUND TRUCK LINES, 3720 AIRPORT WAY S. SEATTLE, WA. 98108

OTI-0YB-2-006580R

PROPOSED DREDGING G DEEP WATER DISPOSAL

IN DUWAMISH RIVER AT SEATTLE

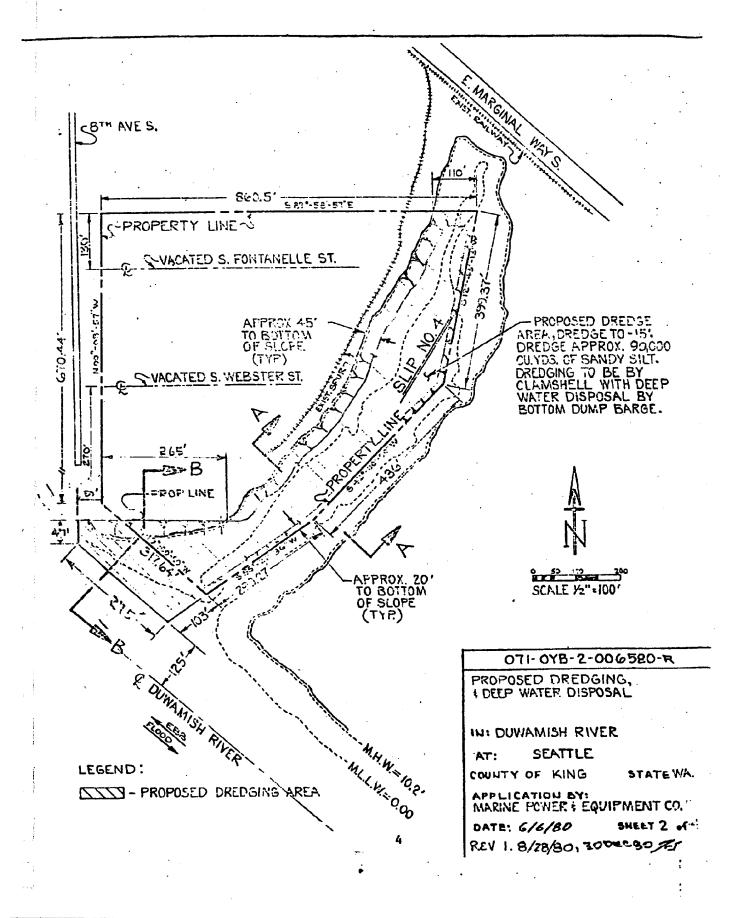
COUNTY OF KING

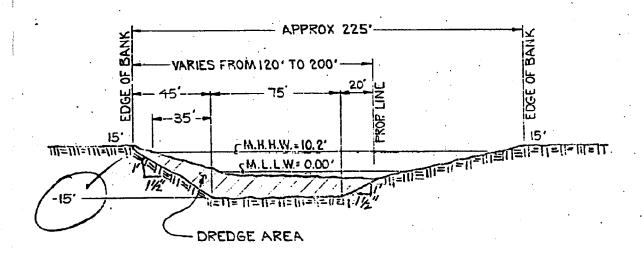
STATE WA.

MARINE POWER + EQUIP CO, INC.

ALL SHEET | OF 4 DATE 4/6/60

ALL BOOK REAL 20 DEC. 20





## SECTION A-A

SCALE: 1" 50'-0"

#### 071-04B-2-006580-K

PROPOSED DREDGING & DEEP WATER DISPOSAL

IN: DUWAMISH RIVER

AT: SEATTLE

COUNTY OF KING

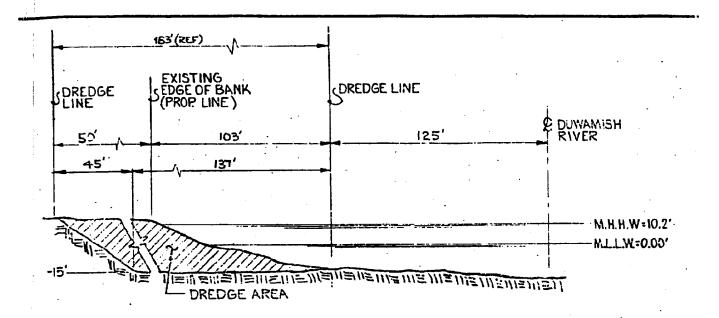
STATE WA.

MARINE POWER & EQUIP CO. INC.

DATE: 6/6/80

SHEET 3 of

REV / 8/28/50, 20040 50,5



## SECTION B-B

SCALE: 1'= 50'-0"

071-0YB-2-006580-R

PROPOSED DREDGING DEEP WATER DISPOSAL

IN DUWAMISH RIYER AT SEATTLE

COUNTY OF KING

STATE WA

MARINE POWER & EQUIP CO. INC.

SHEET 4 OF 4 DATE 6/6/80

REX / 6/25/60, 20 DEC 80

KCSlip4 59445



# DEPARTMENT OF THE ARMY ' SEATTLE DISTRICT, CORPS OF ENGINEERS P.O. BOX C-9785 SEATTLE, WASHINGTON 98124

27 JAN 1981

Darine Fower & Equipment Co., Too. This Trice of TEL 6 1949 ... ontologic for Cantile, Manuington

Reference: 175 ...... 1991.....

Inclosed is a Department of the Army permit which authorizes performance of the work described in your referenced application.

You are cautioned that any change in the location or plans of the work will require submittal of a revised plan to this office for approval prior to accomplishment.

Your attention is drawn to conditions "o" and "n" of the permit which specify the expiration dates for both commencement and completion of the work and that you notify this office of the dates the work is started and completed.

Sincerely yours,

GERALD A. KELLER

Gerald A Kellen

Chief, Regulatory Functions Branch

1 Incl
As stated
CF:
Compliance File

NPS PL 199



Application No	
Name of Applicant Narine Power & Equipment Company	
Effective Date 2 7 JAN 1981	
Expiration Date (If applicable)See _Ceneral Condition o	
DEPARTMENT OF THE ARMY PERMIT	
Referring to written request dated 1 May 1980 for a permit to:	dation of the Chief of Engineers, pursuant
(30 Discharge dredged or fill material into waters of the United States upon the issuance of acting through the Chief of Engineers pursuant to Section 404 of the Federal Water Pollution	a permit from the Secretary of the Army Control Act (86 Stat. 816, P.L. 92-500);
( ) Transport dredged material for the purpose of dumping it into ocean waters upon the issua Army acting through the Chief of Engineers pursuant to Section 103 of the Marine Protectio (86 Stat. 1052; P.L. 92-532);	once of a permit from the Secretary of the on, Research and Sanctuaries Act of 1972
Marine Power & Equipment Company	
1441 N. Northlake Way Seattle, Washington	
is hereby authorized by the Secretary of the Army: to dradge approximately 85 000 milds would be seen to the	
dredge approximately 85,000 cubic yards of sandy silt material to be deposited at deep water site in Elliott I water depth for safe vessel movement)	by clamshell; dradge Bay (Provide adequate
Duwamish River	
** Seattle, Washington	
interpretations with the plane and drawings attached based which are	
in accordance with the plans and drawings attached hereto which are incorporated in and ma file number or other definite identification marks.)  071-0YB-2-006580, 4 sheet	•
572 513 2 55556, 4 Shee	=1.6
sabject to the following conditions:	
I. General Conditions:	
a. That all activities identified and authorized herein shall be consistent with the terms a activities not specifically identified and authorized herein shall constitute a violation of the timey result in the modification, suspension or revocation of this permit, in whole or in part Conditions j or k hereto, and in the institution of such legal proceedings as the United State whether or not this permit has been previously modified, suspended or revoked in whole or in part of the permit has been previously modified, suspended or revoked in whole or in part of the permit has been previously modified.	terms and conditions of this permit which , as set forth more specifically in General et Government may consider appropriate
ENG FORM 1721 EDITION OF 1 APR 74 IS OBSOLETE.	(ER 1145-2-303)
1	
TACL 12	
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KCSlip4 59447

- b. That all activities authorized herein shall, if they involve, during their construction or operation, any discharge of pollutants into waters of the United States or ocean waters, be at all times consistent with applicable water quality standards, effluent limitations and standards of performance, prohibitions, pretreatment standards and management practices established pursuant to the Federal Water Pollution Control Act of 1972 (P.L. 92-500; 86 Stat. 816), the Marine Protection, Research and Sanctuaries Act of 1972 (P.L. 92-532, 86 Stat. 1052), or pursuant to applicable State and local (aw.
- c. That when the activity authorized herein involves a discharge during its construction or operation, of any pollutant (including dredged or fill material), into waters of the United States, the authorized activity shall, if applicable water quality standards are revised or modified during the term of this permit, be modified, if necessary, to conform with such revised or modified water quality standards within 6 months of the effective date of any revision or modification of water quality standards, or as directed by an implementat on plan contained in such revised or modified standards, or within such longer period of time as the District Engineer, in consultation with the Regional Administrator of the Environmental Protection Agency, may determine to be reasonable under the circumstances.
- d. That the discharge will not destroy a threatened or endangered species as identified under the Endangered Species Act, or endanger the critical habitat of such species.
- e. That the permittee agrees to make every reasonable effort to prosecute the construction or operation of the work authorized herein in a manner so as to minimize any adverse impact on fish, wildlife, and natural environmental values.
- f. That the permittee agrees that he will prosecute the construction or work authorized herein in a manner so as to minimize any degradation of water quality.
- g. That the permittee shall permit the District Engineer or his authorized representative(s) or designee(s) to make periodic inspections at any time deemed necessary in order to assure that the activity being performed under authority of this permit is in
- h. That the permittee shall maintain the structure or work authorized herein in good condition and in accordance with the plans and drawings attached hereto.
- i. That this permit does not convey any property rights, either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to property or invasion of rights or any infringement of Federal, State, or local laws or regulations nor does it obviate the requirement to obtain State or local assent required by law for the activity authorized herein.
- j. That this permit may be summarily suspended, in whole or in part, upon a finding by the District Engineer that immediate suspension of the activity authorized herein would be in the general public interest. Such suspension shall be effective upon receipt by the permittee of a written notice thereof which shall indicate (1) the extent of the suspension, (2) the reasons for this action, and (3) any corrective or preventative measures to be taken by the permittee which are deemed necessary by the District Engineer to about imminent hazards to the general public interest. The permittee shall take immediate action to comply with the provisions of this notice. Within ten days following receipt of this notice of suspension, the permittee may request a hearing in order to present information relevant to a decision as to whether his permit should be reinstated, modified or revoked. If a hearing is requested, it shall be conducted pursuant to procedures prescribed by the Chief of Engineers. After completion of the hearing, or within a reasonable time after issuance of the suspension notice to the permittee if no hearing is requested, the permit will either be reinstated, modified or revoked.
- k. That this permit may be either modified, suspended or revoked in whole or in part if the Secretary of the Army or his authorized representative determines that there has been a violation of any of the terms or conditions of this permit or that such action would be permitted be in the public interest. Any such modification, suspension, or revocation shall become effective 30 days after receipt by the permittee of written notice of such action which shall specify the facts or conduct warranting same unless (1) within the 30-day period fact, occur or (b) the alleged violation was accidental, and the permittee has been operating in compliance with the terms and conditions of the permit and is able to provide satisfactory assurances that future operations shall be in full compliance with the terms and bonditions of this permit; or (2) within the aforesaid 30-day period, the permittee requests that a public hearing be held to present oral for making a final decision either to modify, suspend or revoke this permit in whole or in part shall be pursuant to procedures prescribed by the Chief of Engineers.
- 1. That in issuing this permit, the Government has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Government may, in addition, institute appropriate legal proceedings.
- m. That any modification, suspension, or revocation of this permit shall not be the basis for any claim for damages against the United States.
- n. That the permittee shall notify the District Engineer at what time the activity authorized herein will be commenced, as far in advance of the time of commencement as the District Engineer may specify, and of any suspension of work, if for a period of more than one week, resumption of work and its completion.

#### ENVIRONMENTAL ASSESSMENT

For Work Authorized in Accordance with Section 10 of the River and Harbor Act of March 3, 1899 and Section 404 of the Clean Water Act Described in Permit Application No. 071-0YB-2-006580 of Marine Power and Equipment Company

- 1. The work was coordinated with appropriate state and Federal agencies in accordance with procedures specified in 33 CFR, Parts 320-329.
- 2. The work is to dredge approximately 85,000 cubic yards of sandy silt by clamshell in the Duwamish River at Seattle, Washington. (Deposit dredged material at deep water site in Elliott Bay.)
- This application has been reviewed in light of comments received from the public and agency coordination. Evaluation by this office considered relevant factors including esthetics, fish and wildlife values, flood damage prevention, land and shoreline management classifications, conservation, navigation, recreation, water supply, water quality, archeological and historic values, economics, ecological and general environmental considerations, endangered species or their critical habitat, energy needs, safety, food production, and general public welfare. This review has not identified any potentially significant adverse effects for action under the terms of the permit application.
- 4. The work has been considered with respect to Indian Treaty fishing rights, per the decision reached in United States v. Washington, (384 F. Supp. 312, affirmed 520 F. 2d 676, cert. denied 423 U.S. 1086), as modified in Supreme Court's decision of 2 July 1979. I have determined that the work will not significantly interfere with the Indian fishery, including Indian access to usual and accustomed fishing grounds and opportunity to fish in these areas. I have further determined that the work will not significantly interfere with salmonids, their habitat or promote adverse impacts on fishing success in these areas.
- 5. I have determined that performance of this work, in accordance with the conditions of the permit, will not significantly affect the quality of the human environment. Further, I have determined that the issuance of this particular permit is a Federal action not having a significant impact on the environment and thus have concluded that the preparation of a formal EIS is not required.

Colonel Corps of Engineers

District Engineer

#### FINDINGS OF FACT

Reference: Marine Power and Equipment Company - 071-0YB-2-006580

Concerning issuance of Department of the Army Permit under Section 10 of the River and Harbor Act of March 3, 1899 (30 Stat. 1151; 33 U.S.C. 403) and Section 404 of the Clean Water Act to dredge approximately 85,000 cubic yards of sandy silt by clamshell in the Duwamish River at Seattle, Washington. (Deposit dredged material at deep water site in Elliott Bay.)

- 1. I have reviewed and evaluated, in light of the overall public interest, the documents and factors concerning this permit application, as well as the stated views of other interested Federal and non-Federal agencies and the concerned public, relative to the work in navigable waters of the United States.
- 2. All factors relevant to this work were considered in accordance with our regulations. These factors include, but are not limited to, conservation, economics, esthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.
- 3. The following points are considered pertinent in evaluation of comments received in coordinating the public notice dated 23 June 1980 and drawing revision notice dated 23 September 1980. The revision consisted of modifying the boundary configuration of the proposed dredged area to satisfy a concern expressed by the City of Seattle. On 29 October 1980 the applicant further revised the proposed dredged area boundary configuration to insure dredging operations noninterference with an existing submarine telephone cable.
- a. Federal Agencies. The National Oceanic and Atmospheric Administration, the Environmental Protection Agency (EPA) and the Department of the Interior have no objection to the work. EPA, in 10 November 1980 letter, conditioned its nonopposing position advising that the material to be dredged has high concentrations of sulfides. The conditions are:
  - (1) Loads of dredged material to be dumped at Four Mile Rock Disposal Site will be limited to a volume of 1,000 cubic yards.
  - (2) In the event of adverse impacts on fisheries resources, due to the nature of the material being dredged, dredging operations will cease and modifications in the dredging procedures to alleviate the problem will be coordinated with EPA.

The applicant, in 3 November 1980 letter to EPA, advised that the conditions outlined in the 10 November 1980 letter will be complied with. The EPA 3 November 1980 letter will be mailed to the permittee as a condition letter.

#### Marine Power and Equipment Company

- b. State and Local Agencies. The State of Washington and the City of Seattle, the local governing body, have no objections to the work. The State of Washington, in 22 December 1980 letter, conditioned its nonopposing position with the following requirements:
  - (1) A water quality modification be obtained from the Department of Ecology prior to commencement of work.
  - (2) Time Limitation: Construction may be started immediately, and shall be completed by December 31, 1981. A time extension will be considered upon reapplication. However, no dredging shall be accomplished from April 1 to June 15 of any year.
  - (3) A floating clamshell may be used for dredging. Each pass of the clamshell bucket shall be complete, and there is to be no stockpiling in the water.
  - (4) Dredging operations shall be conducted at all times in such a manner as to cause little or no disturbance or siltation to the adjacent waters.
  - (5) Dredged materials shall be deposited at an approved, designated Department of Natural Resources deep water disposal site.
  - (6) The dredged banks shall be sloped no steeper than 1.5 feet horizontal to each 1.0 foot vertical.
  - (7) If, at any time, there should be fish in distress, a fish kill, or water quality problems as a result of this project, the dredging operation shall be stopped immediately. The summer and fall may be critical times of low dissolved oxygen.
  - (8) The following is the limitation of dissolved oxygen:

Allowable dredging - 5.lmg/1 D.O. or over Cease dredging - 5.0mg/1 D.O. or under

- (9) The applicant will be informed if dissolved oxygen does below 5mg/1.
- (10) No petroleum products or other deleterious materials shall be allowed to enter state waters as a result of this project.
- (11) Any debris resulting from this project shall be removed from the water and disposed of or placed in such a manner to prevent its being washed back into the water by high water or wave action.

#### Marine Power and Equipment Company

- (12) Water quality is not to be degraded to the detriment of fish life as a result of this project. Compliance with the quality limits set forth in the Washington State Water Quality Regulations shall be maintained throughout the life of the project.
- (13) These provisions shall be closely followed by the contract(s) and the equipment operator(s) and shall be on the job site at all times.

The State of Washington 22 December 1980 letter will be mailed to the permittee with the permit as a condition letter.

Comments of the state and local governmental agencies are predicated upon the applicant's compliance with the State Shoreline Management Act and applicable local laws, regulations and codes governing this work.

- c. Treaty Indians. The Muckleshoot Indian Tribe, in 8 July 1980 letter, recommended that dredging be conducted between 15 June and 15 March of the calendar year and advised that tribal members will be fishing for salmonids at the worksite between July and January of the calendar year. The applicant, in 5 December 1980 letter to the Muckleshoot Indian Tribe, advised that the dredging is planned to be performed between 15 June and 15 March of the calendar year with the estimated performance period being during the month of January 1981. The applicant further advised the Muckleshoot Indian Tribe that the necessary precautions will be taken to insure noninterference with the Tribe's commercial fishing activities. The work has been considered with respect to the decision reached in United States v. Washington, (384 F. Supp. 312, affirmed 520 F. 2d 676, cert. denied 423 U.S. 1086), as modified in Supreme Court's decision of 2 July 1979, and it was found that the project will not adversely affect any treaty rights.
- d. Individual or Organized Groups. No individual or organized groups have opposed the work. This work is considered to be in the general public interest.
- e. Other Considerations: The work will have no significant adverse effect on items recorded in paragraph 2 above. Particular attention was given to the location and general design to prevent possible obstructions to navigation with respect to both the public use and the neighboring proprietors' access to the Duwamish River.

The work will provide an adequate water depth for safe vessel movement.

f. The work was evaluated in accordance with the objectives of the Environmental Protection Agency's Section 404(b) guidelines, contained in the Clean Water Act (40 CFR 230). The technical evaluation considered the following parameters: physical and chemical-biological interactive effects, water quality impacts, selection of disposal sites, and conditioning of discharges

#### Marine Power and Equipment Company

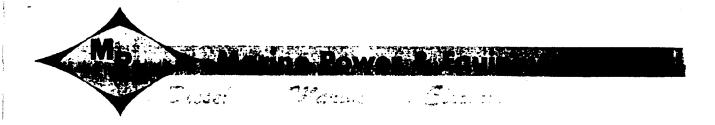
of dredged or fill material. As a result of this evaluation, I have concluded that the discharge will not have significant adverse impacts on the aquatic environment.

4. I find that issuance of this Department of the Army Permit is predicated upon a thorough analysis of the various factors identified herein. The work is deemed to comply with state and local laws, regulations and codes. There are no identified major adverse environmental effects. The work is consonant with National policy, statutes, and administrative directives. The total public interest would best be served by the issuance of a Department of the Army permit.

Date

Date

Colonel, Corps of Engineers
District Engineer



1441 North Northlake Way Seattle, Washington 98103 MElrose 2-1441

December 11, 1980

U.S. Army
Corps of Engineers
Seattle District
P.O. Box C-3755
Seattle, Washington 98124

Attn: Regulatory Functions Branch

Joe Thomer

Re: Permit Application 071-0YB-2-006580

Dear Sir:

The original revision of the subject permit application was in response to concern expressed by Elsie Hulsizer of the City of Seattle, Department of Construction and Land Use. The original plan left a small tip of land sticking out into Slip 4 and she was concerned about erosion of that area.

I agreed to expand the dredging area to cut off that particular tip of land.

After the revision was made I realized that the newly added dredge area was in close proximity to an under water telephone cable which crosses the Duwamish River. To preclude any interference with the subject cable I elected to further revise the dredge area and provided you with the required drawings.

If you have any further questions, please call.

Very truly yours,

MARINE POWER & EQUIPMENT CO., INC.

Bruce H. Klein

RHK: sw

### Seattle Engineering Department

Arthur E. Maronek
Acting Orector of Engineering
Charles Rover Mayor

RE: 071-0YB-2-006580-R

MARINE ROUTE & BOUPHOUT CO.

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NOVEMBER 20, 1980

Department of the Army Seattle District Corps of Engineers P. O. Box C-3755 Seattle, Washington 98124

Gentlemen:

The City of Seattle has reviewed the subject Public Notice. Based upon comments which have been received from various City departments, we offer the following statement(s):

- 1. We have no objection to the proposal as described in the subject Public Notice.
  - 2. The proposal is exempt from the permit requirements of the Shoreline Management Act under the Seattle Shoreline Master Program.
- The proposal is consistent with the Seattle Shoreline Master Program and Substantial Development Permit No. SMA 80-45 was approved on NOVEMBER 4 1980.
  - Applicant has applied for a Shorelines Substantial Development Permit.
     We reserve comments on the proposal until our review of the Shorelines Permit has been completed.
  - 5. Applicant is hereby advised that a Shorelines Substantial Development Permit is required under the Shoreline Management Act of 1971. Application forms are available from the Seattle Department of Construction and Land Use, 503 Municipal Building, Seattle, Washington, 98104. We request that the Department of the Army permit for this proposal be withheld until a Substantial Development Permit is obtained.
  - 6. Other:

Very truly yours,

cc: Dept. of Construction and Land Use

State Dept. of Ecology

ARTHUR E. MARONEK
Acting Director of Engineering

R. J. ANDERSON, E. E., Manager Court & Right of Way Division

"An Equal Employment Opportunity - Aftirmative Action Employer"

Seattle Engineering Department Room 910, Seattle Municipal Building, 600 Fourth Avenue, Seattle, WA 98104, (206) 625-2391

316A

#### U.S. ENVIRONMENTAL PROTECTION AGENCY



#### REGION X

#### 1200 SIXTH AVENUE SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: 1/S 521

NOV 1 0 1980

District Engineer
Seattle District, C/E
ATTN: Chief, Reg. Func. Branch
P. O. Box C-3755
Seattle, Washington 98124

RE: 071-0YB-2-006580-R, Marine Power and Equipment Company, Inc., 6/23/80

Dear Sir:

We have completed our review of the above referenced permit application.

Chemical analyses indicate that the material to be dredged has relatively high concentrations of sulfides. However, our agency will have no objection to the issuance of this permit provided the proposed operations are subject to the following conditions:

- Loads of dredged material to be dumped at 4 Mile Rock disposal site will be limited to a volume of 1,000 cubic yards,
- 2) In the event of adverse impacts on fisheries resources, due to the nature of the material being dredged, dredging operations will cease and modifications in the dredging procedures to alleviate the problem will be coordinated with our office.

These conditions are needed to maintain water quality and to protect the aquatic resources.

These conditions have been discussed with and agreed to by the applicant. If there are any questions concerning our review of this application please contact James Wood, of my staff, at (206) 442-1352 or FTS 399-1352.

Sincerely,

Ronald A. Lee, Chief

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Dredge and Fill Permits Section

cc: USFWS - Olympia

NMFS

WDNR - Attn. Rene Herrera

WDG - Attn. Bob Zeigler

WDE

Applicant

311 0

KCSlip4 59456

The Department of the Army permit program is authorized by Section 10 of the River and Harbor Act of 1899, Section 404 of P. L. 92—500 and Section 103 of P. L. 92—532. These laws require permits authorizing structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided in ENG form 4345 will be used in evaluating the application for a permit. Information in the application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be pro-

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and checklist) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

Application number (To be assigned by Corps)	2. Date	3. For Corps use only.		
071-043-2-006580	1 May 1980			
<ol> <li>Name and address of applicant.         Marine Power &amp; Equipment Co., Inc.         1441 N. Northlake Way         Seattle, Washington 98103</li> </ol>	5. Name, address and title of authorized agent. Bruce H. Klein Personnel Director 1441 N. Northlake Way Seattle, Washington 98103  A/C 206, 632-1441  A/C 206, 632-1447			
Telephone no. during business hours  A/C 206; 632-1441  A/C 206; 632-1447				

6. Describe in detail the proposed activity, its purpose and intended use (private, public, commercial or other) including description of the type of structures, if any to be erected on fills, or pile or float—supported platforms, the type, composition and quantity of materials to be discharged or dumped and means of conveyance, and the source of discharge or fill material. If additional space is needed, use Block 14.

Dredge 85,000 cu. yards of sandy silt by clamshell and deposit at "Four Mile Rock" deep water disposal site by bottom dump barge. The purpose is to provide a safe depth for commercial marine use in Slip 4.

- Names, addresses and telephone numbers of adjoining property owners, lessees, etc., whose property also adjoins the waterway.
   Boeing Co. 7755 E. Marginal Way South Seattle, Washington 98108 (773-7790)
  - Layrite Concrete Products Co. 7265 E. Marginal Way S. Seattle, Wa (762-8681)
  - 3. Puget Sound Truck Lines 3720 Airport Way South Seattle, Wa 78134

8.	Location where proposed activity exists or will occur.						
	Address:			Tax Assess	ors Description: (I	f known)	
	8th Ave.	South and S	outh Fontanelle	St.		•	
	Street, road or other descriptive location			Map No.	Subdiv. No.	Lot No.	
	Seattle						
	In or near city or town			Sec.	Twp.	Rge.	
	King	Wash.	98108				
	County	State	Zip Code				

ENG Form 4345, 1 OCT 77

Duwamish River

Edition of 1 Apr 74 is obsolete.

- )	ets activity is proposed to commence. As soon as permit is issued
Ð	ete activity is expected to be completed Within 5 weeks after start of project
	any portion of the activity for which authorization is sought now complete? YES XXX NO
	. Indicate the existing work on the drawings.
-	
. L	ist all approvals or certifications required by other federal, interstate, state or local agencies for any structures, construc- ion, discharges, deposits or other activities described in this application.
	Issuing Agency Type Approval Identification No. Date of Application Date of Approval
}	City of Seattle Shoreline Permit
	las any agency denied approval for the activity described herein or for any activity directly related to the activity lescribed herein?
	Yes Who (If "Yes" explain in remarks)
,	
	lemarks or additional information.
:	
	·
:	
1	Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true.
,,	complete, and accurate. I further certify that I possess the authority to undertake this proposed activities,
1	Signature of Applicant or Authorized Agent
į.	Bruce H. Klein
- 1	The application must be signed by the applicant; however, it may be signed by a duly authorized agent (named in Item 5) if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application.
	18 U. S. C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisioned not more than five years, or both. Do not send a permit processing fee with this application. The appropriate fee will be assessed when a permit processing fee with this application.